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Regional economic shocks and migration

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Standard symbols for Statistics Canada

The following standard symbols are used in Statistics Canada publications:

.	not available for any reference period
..	not available for a specific reference period
...	not applicable
0	true zero or a value rounded to zero
0^s	value rounded to 0 (zero) where a meaningful distinction exists between true zero and the value rounded
p	preliminary
r	revised
x	suppressed to meet the confidentiality requirements of the *Statistics Act*
E	use with caution
F	too unreliable to be published

Highlights

In this issue

Regional economic shocks and migration

- Residents of census agglomerations (CAs) or census metropolitan areas (CMAs) with less than 500,000 residents were much more likely to migrate than residents of large metropolitan centres. In 2008, for example, the migration rate for those age 20 to 54 living in a CA with 10,000 to 19,999 residents was 7.9%, compared to 2.3% for persons the same age living in a CMA with 500,000 or more residents.
- From 2000 to 2008, people living in a region where the unemployment rate went up by one percentage point in relation to the national average between two years had virtually the same probability of migration as people in regions where the unemployment rate had remained close to the national average in the same two years.
- Similarly, individuals living in a region where hourly earnings had declined by $1 per hour in relation to the national average between two years were only slightly more likely to migrate than those living in a region where regional average hourly earnings remained the same as in the rest of the country during the same period.
- However, people who experienced a deterioration of their personal economic situation in relation to others were much more likely to migrate than persons whose economic situation had remained unchanged. Thus, individuals whose income had decreased by 30% or more over two years were 82% more likely to leave their region than those whose income had not changed.
- Unlike other Canadians, recent immigrants living in a region where unemployment had increased by one percentage point in relation to the national average between two given years were 10% more likely to migrate than immigrants living in a region where the unemployment rate had remained the same over the same two years.

Regional economic shocks and migration

André Bernard

Every year, Canadian communities experience economic slowdowns, often caused by the closing of key establishments in the local economy. When the employment and wage prospects of one region weaken in relation to others, residents—particularly those active in the labour force—look to migrate elsewhere to improve their economic situation. Theoretically, the decision to migrate or remain in one's region is linked in part to the probability of finding a job and the expected level of income in the regions considered (Todaro 1986 and 1969).

There are advantages to migrating from one region of the country to another. For example, people who were laid off and would otherwise be unemployed may find work in regions experiencing labour shortages. In such cases, migration serves as a market-adjustment mechanism (Blanchard and Katz 1992). However, significant decreases in population may have negative consequences for the affected regions. The economic and social vitality of those regions can suffer if property tax revenue and thus municipal services decline or stagnate. Such a situation may then exacerbate the region's economic decline, especially if those leaving are the most skilled or the youngest.[1]

The people who leave following a regional economic shock are not necessarily the individuals directly affected by the job or income losses. Others may perceive a weakening in their long-term job and earnings outlooks and thus look to migrate. For example, an increase in a region's unemployment or a decline in average earnings will generally limit residents' potential wage increases and their chances of obtaining new, higher-paying jobs in the same region. If unemployment rates and average hourly wages remain the same in other regions, they will become more attractive to potential migrants.

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Such economic shocks are more likely to affect communities with smaller populations. The economies of large metropolitan centres are generally more diversified (Beckstead and Brown 2003) and therefore less subject to abrupt changes. The economic prosperity of cities outside large metropolitan centres and migration problems associated with them can draw the attention of public policy makers.[2] For example, if a policy's objective is to promote retention of residents in a given region, it is important to know the extent to which economic considerations play a key role in the decision of these residents to migrate or not.

Most studies examining the link between economic conditions and internal migration in Canada have looked at interprovincial migration (Finnie 2004, Coulombe 2006, Bernard et al. 2008, and Ostrovsky et al. 2008).[3,4] Instead this study considers migration from one census agglomeration (CA) or census metropolitan area (CMA) to another.[5] The main objective is to determine if there is a link between regional economic shocks and the migration of residents. The impact of changes in the economic situation of individuals on migration will also be examined. Regional economic shocks are defined by changes in regional economic conditions, measured by two variables: unemployment rate and average hourly earnings. These two variables reflect the extent to which a region offers strong employment opportunities at good wages for its residents. The economic situation of individuals is measured by the level of and changes in annual personal income.

The focus of this study is on migration from cities outside large metropolitan centres, that is, CAs and CMAs of less than 500,000 people. The migration period covered is from 2000 to 2008.[6]

The preliminary goal of the study is to document migration during the period studied based on the size of the population of the CA and CMA. This is done to determine the extent to which residents of smaller

CAs and CMAs are more likely to migrate. The destination of these migrants will also be examined. Are they mostly going to large metropolitan centres or are they migrating to similarly sized CAs or CMAs?

The primary data sources used for this study are the Longitudinal Administrative Databank (LAD) and the Labour Force Survey (LFS) (see *Data sources and definitions*).

Migration much higher in small CAs

In general, the smaller a region's population, the higher its migration rate. For example, in 2008, the migration rate among persons age 20 to 54 living in a CA with a population between 10,000 and 19,999 was 7.9% (Table 1). In other words, 7.9% of the population of those regions in 2007 had migrated to another CA or CMA in Canada in 2008. In contrast, in CMAs of 500,000 or more, this rate was only 2.3%. So residents of small CAs were more than three times more likely to migrate elsewhere in the country than persons living in large CMAs.

A negative relationship between the size of a CA's or CMA's population and its rate of migration in each year considered is observed from 2000 to 2008. CAs with medium-sized populations have lower migration rates than CAs with smaller populations.

Table 1 Migration rate by CA or CMA population, persons age 20 to 54

	Population				
	10,000 to 19,999	20,000 to 49,999	50,000 to 99,999	100,000 to 499,999	500,000 or more
			%		
2000	7.6	6.2	5.5	4.2	2.5
2001	8.4	6.6	5.7	4.5	2.8
2002	8.2	7.7	6.3	3.5	2.0
2003	10.0	7.8	6.9	5.2	3.4
2004	8.5	6.2	5.6	4.3	2.7
2005	8.4	6.5	5.6	4.3	2.6
2006	8.2	6.6	5.6	4.3	2.8
2007	10.4	9.9	6.2	4.5	2.8
2008	7.9	7.0	5.2	3.9	2.3

CA Census agglomeration
CMA Census metropolitan area
Source: Statistics Canada, Longitudinal Administrative Databank, 1999 to 2008.

Data sources and definitions

The main databank used in this study is the **Longitudinal Administrative Databank (LAD)**. It comprises a 20% random sample of the annual T1 Family File (T1FF), a cross-sectional file of all tax filers and their families. Census families are identified from the information provided to the Canada Revenue Agency in tax returns and applications for the Canada Child Tax Benefit. These sources provide longitudinal data on individuals and their families, like sources of income and such basic sociodemographic characteristics as place of residence, age, sex, and family type. LAD currently covers the period from 1982 to 2009. In this study, the data from 1999 to 2008 were used.

For the purpose of this study, a move has taken place when a person lives in a census agglomeration (CA) or census metropolitan area (CMA) at *t-1* and lives in another at *t*. Conversely, no move has taken place when the person lives in the same CA or CMA during the two years. Persons who leave the country are excluded from the analysis for their years outside the country. The first moves were observed between 1999 and 2000 and the last between 2007 and 2008.[7]

In addition, if the person was a student at *t-1* or at *t*, the move is excluded. Students often attend institutions outside their region of origin and their migration status may be difficult to interpret for that reason. The tax deduction for full-time studies is used to identify students, with those in full-time studies at least four months in a year considered as students.

The sample is restricted to persons age 20 to 54 since they are much more likely to be involved in the workforce and to migrate than younger or older Canadians. Moves that may be related to a transition to retirement were intentionally excluded.

The population sizes for the CAs and CMAs are from the **2006 Census** (see Appendix for a list of the CAs and CMAs by population size). The **Postal Code Conversion Files from 2000 to 2008** were used to identify the CA or CMA of residence for each individual in LAD. The family postal code, available in LAD, was matched to the Postal Code Conversion File.[8]

The data on regional economic conditions were drawn from the **Labour Force Survey (LFS)**. The LFS is a monthly survey of approximately 54,000 Canadian households that provides details on employment and unemployment in Canada. It covers the civilian population 15 years of age and over, but excludes persons living on reserves and in other Aboriginal settlements in the provinces, full-time members of the Canadian Armed Forces, and persons living in institutions. The unemployment rate and average hourly earnings for each year were calculated for each CA of 50,000 residents or more and for each CMA, as well as for the country as a whole.

Immigrants are identified through the **Longitudinal Immigration Database (IMBD)**, which is a file linked to LAD. The IMBD, created by Citizenship and Immigration Canada, contains a variety of information on immigrants at time of landing in Canada.

Migration to large metropolitan centres

Large metropolitan centres are attractive to migrants from CAs and CMAs with less than 500,000 residents. However, migrants are not more susceptible than Canadians in general to live in these large metropolitan areas following their migration.

Large CMAs were by far the most frequent destination for migrants from CAs or CMAs in all population categories. For example, 39.6% of migrants from a CA with a population between 10,000 and 19,999 chose CMAs of 500,000 or more (Table 2). In contrast, only 7.3% remained in a CA with a similarly sized population.

There is a similar phenomenon with migrants from CAs with a population between 20,000 and 49,999 and between 50,000 and 99,999. Some 45.2% and 47.0% respectively of these migrants chose to move to a large CMA, whereas less than 15% chose to migrate to a CA with a population similar in size to their own.

Even migrants who leave a CMA with a population between 100,000 and 499,999 were more than twice as likely to migrate to a CMA with a population of 500,000 or more (53.2%) than to a CMA with a population of similar size to their own (22.4%).

The stronger attraction of large metropolitan centres is not unexpected. Indeed, one might surmise that the number of migrants moving to a given region is more or less proportional to the size of the region's population. Thus, compared to the population in general, migrants from the smallest towns are not more likely, after migrating, to live in a large metropolitan centre. On average from 2000 to 2008, 64.9% of the population age 20 to 54 lived in a CMA of 500,000 or more, which is actually much higher than the proportion of migrants from smaller CMAs or CAs who moved to these CMAs.

Little difference in the economic conditions of areas of origin and areas of destination

To establish a link between regional economic conditions and migration, the annual unemployment rate and average hourly earnings for each CA of 50,000 or more and each CMA were compiled. These data were obtained from the Labour Force Survey (LFS) (see *Data sources and definitions*). These data enable us to determine if people move from regions with a relatively high rate of unemployment and relatively low rates of pay to regions with relatively low unemployment and relatively high rates of pay.

On average, the economic conditions of the regions that migrants leave and the economic conditions of the regions to which migrants move are similar at the time of departure and arrival to the national average. From 2000 to 2008, the unemployment rate of the CAs and CMAs of origin was 6.8% on average, whereas the unemployment rate of the CAs and CMAs of destination was 6.6%[2] (Table 3). In both cases, the difference between the regional unemployment rate and the national average for the corresponding year was 0.2 percentage points.

Thus, we do not see any general movement from CAs or CMAs with relatively high unemployment to CAs or CMAs with relatively low unemployment.

Table 2 Origin and destination of migrations by CA or CMA population, persons age 20 to 54

	Regions of destination (residents)					
	10,000 to 19,999	20,000 to 49,999	50,000 to 99,999	100,000 to 499,999	500,000 or more	Distribution of the population[1]
Regions of origin (residents)	%					
10,000 to 19,999	7.3	15.0	16.4	21.6	39.6	1.8
20,000 to 49,999	3.9	13.9	11.8	25.1	45.2	6.3
50,000 to 99,999	4.8	10.9	10.3	27.1	47.0	7.0
100,000 to 499,999	3.0	9.9	11.5	22.4	53.2	20.0
500,000 or more	3.0	8.8	10.8	30.9	46.6	64.9

CA Census agglomeration
CMA Census metropolitan area
1. Average distribution of the population from 2000 to 2008.
Source: Statistics Canada, Longitudinal Administrative Databank, 1999 to 2008.

Table 3 Unemployment rate and average hourly earnings of regions of origin and regions of destination for migrants age 20 to 54 whose region of origin is a CA or CMA with less than 500,000 residents

	Before migration		After migration
		%	
Regional unemployment rate[1]	6.8		6.6
		$ per hour	
Regional average hourly earnings[1]	17.70		18.30
Difference in relation to national average		percentage points	
Unemployment rate	-0.2		-0.2
		$ per hour	
Earnings	-0.50		-0.50

CA Census agglomeration
CMA Census metropolitan area
1. The unemployment rate and average hourly earnings before migration (*t-1*) are compared to the national average at *t-1*, whereas those after migration are compared to the national average at *t*.
Sources: Statistics Canada, Longitudinal Administrative Databank, 1999 to 2008; Labour Force Survey, 1999 to 2008.

The same holds true for regional average hourly earnings. Although migrants left regions with slightly lower hourly earnings, they tended to move to regions where there was a similar gap in hourly earnings ($-0.50/hour) in relation to the national average.

Little influence of regional economic shocks but strong influence of changes in personal income

The estimated impact of the effect of regional economic shocks on migration using regression models are presented below (see *Logistic regression models*).

Changes in regional economic conditions appear to have a negligible impact on the probability of residents migrating, except when their own income is affected, in which case the probability of migration increases considerably.

Residents of a region where the unemployment rate increases by one percentage point in relation to the national average between two years have almost the same probability of migration as residents of regions where the unemployment rate remains similar to the national average during those two years. In both instances, the probability of migration is about 6.0% (Table 4).

The same conclusion can be reached with regard to changes in regional average hourly earnings. Those living in a region where hourly earnings decrease by $1/hour in relation to the national average between two years are only slightly more likely to migrate than those living in a region where regional average hourly earnings remain the same as in the rest of the country. The migration probability is between 5.8% and 6.0% depending on the situation.

However, changes in individuals' incomes have a major impact on the probability of migration. People whose incomes decline by 30% or more between two years, when the income level of these individuals in the two previous years is taken into account, are 82% more likely to leave their CA or CMA the following year than individuals whose incomes remain stable. In other words, people who experience a deterioration of their personal economic situation compared to others are more likely to migrate than persons whose economic situation remains unchanged.

Individuals whose income falls by a smaller proportion are also more likely to migrate than people whose incomes remain stable, but the difference is smaller. For example, people whose incomes decrease by 20% or more but less than 30% are 49% more likely to migrate than individuals whose incomes remain stable. Thus, the greater the decline in income, the more incentive there is to migrate.

It should be noted that increases in income are also associated with a greater migration probability, although the relationship is much weaker than for equivalent decreases in income. For example, persons whose incomes rise by 30% or more between two years are 46% more likely to migrate than persons whose incomes do not change. Results for men and women are similar, both in the case of regional economic shocks and changes in personal income.

Previous studies have shown that, on average, migrants experience higher increases in earnings than non-migrants, especially among those who leave one of the Atlantic provinces, Quebec or Saskatchewan (Bernard et al. 2008, Finnie

Table 4 Probability of migration, persons age 20 to 54 living in a CA or CMA with less than 500,000 residents

	Total		Men		Women	
	Predicted probability	Ratio to the baseline probability	Predicted probability	Ratio to the baseline probability	Predicted probability	Ratio to the baseline probability
	%	ratio	%	ratio	%	ratio
Baseline probability[1]	**6.0**	...	**6.1**	...	**5.6**	...
Regional unemployment rate at *t-1*						
Difference of one point with the entire country, at *t-1* (ref. no difference)	6.0	0.99*	6.1	0.99*	5.5	0.99*
Regional average hourly earnings at *t-1*						
Difference of $1/hour with the entire country, at *t-1* (ref. no difference)	5.8	0.97*	6.0	0.97*	5.4	0.97*
Change in income between *t-2* and *t-1*						
Gain of 30% or more	8.8	1.46*	9.2	1.50*	8.0	1.43*
Gain of 20% to less than 30%	7.5	1.25*	7.9	1.28*	6.7	1.21*
Gain of 10% to less than 20%	7.1	1.19*	7.4	1.20*	6.5	1.17*
Gain of 5% to less than 10%	6.6	1.09*	6.7	1.09*	6.0	1.09*
No change (between -5% and +5%)	ref.	ref.	ref.	ref.	ref.	ref.
Loss of 5% to less than 10%	6.8	1.13*	6.8	1.11*	6.4	1.16*
Loss of 10% to less than 20%	7.8	1.30*	8.0	1.29*	7.3	1.31*
Loss of 20% to less than 30%	9.0	1.49*	9.1	1.48*	8.4	1.52*
Loss of 30% or more	10.9	1.82*	11.0	1.78*	10.4	1.87*

* significantly different from the baseline probability at the 5% level
CA Census agglomeration
CMA Census metropolitan area
1. The model also includes the following variables (the reference category, used to calculate probabilities, is in parentheses): differences between regional and national unemployment rates at *t-2* and *t-3* (no difference), differences between regional and national hourly earnings at *t-2* and *t-3* (no difference), the income quintile at *t-2* (third quintile), the income quintile at *t-3* (third quintile), age (25 to 34 years), sex (male), province and distance from a large CMA (Ontario, less than 100 km), population of the CA or CMA (CMA with less than 500,000 residents), family type (couple without children) and year (2008).
Sources: Statistics Canada, Longitudinal Administrative Databank, 1997 to 2008; Labour Force Survey, 1997 to 2008.

2004). The results presented in this study indicate that migration enables many people to improve their economic situation. However, the analysis does not give any indication that people are more likely to migrate following a negative regional shock if their own economic situation remains stable. The indirect effects of a perceived weakening on an individual's economic outlook would therefore be very low, unless they were offset by other unobserved phenomena. However, this result is consistent with the findings of a previous study showing that provincial economic shocks had little impact on net provincial migration rates (Coulombe 2006).

People age 35 to 54 more likely to migrate following a change in income

The analysis by age group does not reveal any divergence from the general findings regarding the impact of regional economic shocks on migration. Whether those age 20 to 34, 35 to 44 or 45 to 54 are considered, changes in the regional unemployment rate or in regional average hourly earnings in relation to the national average do not significantly change the probability that residents will migrate (Table 5).

On the other hand, persons age 35 to 44 and 45 to 54 are more likely to migrate following a decline in their personal incomes than persons age 20 to 34.

Logistic regression models

When an economic shock hits a particular region, it can be expected that the regional unemployment rate will increase but that the unemployment rate for the rest of the country will remain essentially unchanged. Similarly, the wages in the affected region will likely drop[11] while wages in the rest of the country will remain practically unchanged.

To reflect this situation in the models, the probability of an individual migrating from year *t-1* to *t* is based on the differences between the regional and national unemployment rates at *t-1*, *t-2* and *t-3*, and the differences between regional and national average hourly earnings at *t-1*, *t-2* and *t-3*. This allows the impact of an increase (decrease) of one percentage point in the regional unemployment rate in relation to the national average between two years on the probability of an individual migrating to be measured. In the same way, the effect of an increase (decrease) of one dollar in regional average hourly earnings in relation to the national average between two years on the probability of an individual migrating can be measured. The model therefore explicitly measures the effect of asymmetric regional economic shocks and not the effect of shocks on the entire country, which might occur, for example, in the case of a general recession throughout the country. The variables of interest are the unemployment rate and average hourly earnings at *t-1*. The variables at *t-2* and *t-3* are added to ensure that a positive or negative difference at *t-1* reflects an economic shock as much as possible and not a pre-existing trend in the regional unemployment rate or average hourly earnings.

Using the same principle, the model also includes changes in personal income between *t-2* and *t-1*. In this way, the impact of an individual's income increasing or decreasing by different percentages from *t-2* to *t-1* on the probability of migrating from *t-1* to *t* can be measured. Once again, to ensure that these changes are not merely reflecting pre-existing income trends, the income quintile at *t-2* and *t-3* is also included in the model. In other words, this specification makes it possible to test the hypothesis that a person whose income was comparable to that of other Canadians at *t-3* and *t-2* but who experiences a major drop in income the following year will be more inclined to migrate.

Lastly, the model takes various individual and regional characteristics at *t-1* that may affect migration probability into account: age, sex, immigrant status, family type, size of the population of the CA or CMA, province and distance from a large CMA, and year.

More specifically, the model, which is estimated using logistic regressions, is specified as follows:

$$\text{Prob}(mig_{i,r,t}=1) = f\big((\text{Regional unemployment rate} - \text{National unemployment rate})_{t-1},$$
$$(\text{Regional unemployment rate} - \text{National unemployment rate})_{t-2},$$
$$(\text{Regional unemployment rate} - \text{National unemployment rate})_{t-3},$$
$$(\text{Regional average hourly earnings} - \text{National average hourly earnings})_{t-1},$$
$$(\text{Regional average hourly earnings} - \text{National average hourly earnings})_{t-2},$$
$$(\text{Regional average hourly earnings} - \text{National average hourly earnings})_{t-3},$$
$$\text{Change in income}_{i,\ t-2\ \text{to}\ t-1},$$
$$\text{Income quintile}_{i,\ t-2},$$
$$\text{Income quintile}_{i,\ t-3},$$
$$X'_{i,t-1},\ X'_{r,\ t-1},\ \text{Year}\ \big).$$

Thus, the probability of an individual *i* migrating from one region *r* between *t-1* and *t* is a function of the differences between the regional national unemployment rates at *t-1*, *t-2 and t-3*, the differences between the regional and national average hourly earnings at *t-1*, *t-2 and t-3*, changes in the individual's income between *t-2* and *t-1*, the individual's income quintile at *t-2* and *t-3*, individual characteristics X_i at *t-1* and regional characteristics X_r at *t-1*. Since the databank is organized in person years, dummy variables representing the year of migration (from 2000 to 2008) are also included.

The individual characteristics X_i considered are

- age group at *t-1*, where the age groups are 20 to 24 years, 25 to 34 years, 35 to 44 years and 45 to 54 years
- sex at *t-1*
- family type at *t-1*, where the categories are couples with children (youngest child is under 12 years), couples with children (youngest child is 12 years or over), couples without children, lone parents, persons living alone, filing child.

The regional characteristics X_r considered are

- size of the population of the CA at *t-1*, where the population size groups are 50,000 to 99,999 and 100,000 to 499,999.
- the province of the CA or CMA of residence and its distance[12] from a CMA of 500,000 or more at *t-1*, where the categories are
  - Newfoundland and Labrador
  - Prince Edward Island
  - Nova Scotia
  - New Brunswick
  - Quebec, less than 100 km from Québec or Montréal
  - Quebec, between 100 km and 250 km from Québec or Montréal
  - Quebec, more than 250 km from Québec or Montréal
  - Ontario, less than 100 km from Ottawa–Gatineau, Toronto or Hamilton
  - Ontario, between 100 km and 250 km from Ottawa–Gatineau, Toronto or Hamilton
  - Ontario, more than 250 km from Ottawa–Gatineau, Toronto or Hamilton
  - Manitoba
  - Saskatchewan
  - Alberta, less than 100 km from a Calgary or Edmonton CMA
  - Alberta, between 100 km and 250 km from a Calgary or Edmonton CMA
  - Alberta, more than 250 km from a Calgary or Edmonton CMA
  - British Columbia, less than 100 km from Vancouver
  - British Columbia, between 100 km and 250 km from Vancouver
  - British Columbia, more than 250 km from Vancouver.

Logistic regression models (concluded)

Distance can represent a major impediment to mobility. Migration over a very long distance can be monetarily costly and have a more substantial impact on a personal level. In contrast, in communities in southwest Ontario, close to the large CMAs of Toronto or Hamilton, which have the highest population densities in the country, migration from one region to another may be much less costly.[13] Consequently, to ensure that the effect of economic conditions on the probability of migration do not merely reflect a distance effect, this element has been taken into account.

Separate regressions were also run by age group, sex and immigrant status.

LAD unfortunately does not contain any data on level of education and labour force status. Level of education is positively associated with migration (Dion and Coulombe 2008) and would therefore have been included as a variable in the modelling if it had been available. In addition, although significant reductions in income are often involuntary and may be the result of a layoff or employment difficulties, especially if income had been stable in the previous two years, this is not always the case. Reductions in income can be the result of a voluntary retirement from the labour force or a reduction in the number of hours worked. Unfortunately, it is not possible to distinguish the effect of voluntary and involuntary decreases in income on migration with these data.[14]

Table 5 Probability of migration by age group, persons age 20 to 54 living in a CA or CMA with less than 500,000 residents

	20 to 34 years		35 to 44 years		45 to 54 years	
	Predicted probability	Ratio to the baseline probability	Predicted probability	Ratio to the baseline probability	Predicted probability	Ratio to the baseline probability
	%	ratio	%	ratio	%	ratio
Baseline probability[1]	**5.8**	...	**3.6**	...	**2.9**	...
Regional unemployment rate at *t-1*						
Difference of one point with the entire country, at *t-1* (ref. no difference)	5.8	0.99*	3.6	0.99*	2.9	0.99*
Regional average hourly earnings at *t-1*						
Difference of $1/hour with the entire country, at *t-1* (ref. no difference)	5.6	0.97*	3.6	1.00*	2.8	0.96*
Change in income between *t-2* and *t-1*						
Gain of 30% or more	8.2	1.41*	5.3	1.48*	4.5	1.57*
Gain of 20% to less than 30%	7.0	1.20*	4.5	1.25*	3.7	1.30*
Gain of 10% to less than 20%	6.7	1.15*	4.3	1.20*	3.4	1.19*
Gain of 5% to less than 10%	6.2	1.07*	4.0	1.10*	3.1	1.07*
No change (between -5% and +5%)	ref.	ref.	ref.	ref.	ref.	ref.
Loss of 5% to less than 10%	6.4	1.11*	4.2	1.16*	3.3	1.13*
Loss of 10% to less than 20%	7.3	1.26*	4.7	1.31*	3.9	1.35*
Loss of 20% to less than 30%	8.0	1.38*	5.8	1.60*	4.7	1.62*
Loss of 30% or more	9.5	1.64*	7.4	2.06*	5.7	1.98*

* significantly different from the baseline probability at the 5% level
CA Census agglomeration
CMA Census metropolitan area
1. The model also includes the following variables (the reference category, used to calculate probabilities, is in parentheses): differences between regional and national unemployment rates at *t-2* and *t-3* (no difference), differences between regional and national hourly earnings at *t-2* and *t-3* (no difference), the income quintile at *t-2* (third quintile), the income quintile at *t-3* (third quintile), age (25 to 34 years), sex (male), province and distance from a large CMA (Ontario, less than 100 km), population of the CA or CMA (CMA with less than 500,000 residents), family type (couple without children) and year (2008).
Sources: Statistics Canada, Longitudinal Administrative Databank, 1997 to 2008; Labour Force Survey, 1997 to 2008.

Individuals age 35 to 44 and 45 to 54 whose incomes drop 30% or more between two years are respectively 106% and 98% more likely to leave their CA or CMA than people in the same age group whose incomes remain stable. The likelihood increases by 64% for those between the ages of 20 and 34.

This result may be explained by the fact that the earnings of middle-aged people, follow, on average, a relatively stable, upward trajectory (Hébert and Luong 2009). Decreases in income in this age group could be more likely to come from layoffs, which could prompt many of these individuals to migrate. In contrast, for younger individuals, reductions in income may be the result of voluntary cutbacks in hours worked, parental leave or part-time studies. Unfortunately, differences between voluntary and involuntary reductions in income cannot be distinguished with the data used. Regardless, the data presented in this study do not accord with the generally observed greater mobility of young people (Dion and Coulombe 2008) associated with a greater sensitivity to changes in economic conditions or personal income.

Table 6 Probability of migration of recent immigrants, age 20 to 54 living in a CA or CMA with less than 500,000 residents

	Total		Men		Women	
	Predicted probability	Ratio to the baseline probability	Predicted probability	Ratio to the baseline probability	Predicted probability	Ratio to the baseline probability
	%	ratio	%	ratio	%	ratio
Baseline probability[1]	**7.4**	...	**7.2**	...	**6.7**	...
Regional unemployment rate at *t-1*						
Difference of one point with the entire country, at *t-1* (ref. no difference)	8.1	1.10*	8.0	1.11*	7.3	1.08*
Regional average hourly earnings at *t-1*						
Difference of $1/hour with the entire country, at *t-1* (ref. no difference)	7.4	1.01	7.0	0.98	7.0	1.03
Change in income between *t-2* and *t-1*						
Gain of 30% or more	8.3	1.12*	7.8	1.10	7.7	1.15
Gain of 20% to less than 30%	7.6	1.03	7.3	1.03	7.0	1.04
Gain of 10% to less than 20%	7.7	1.04	7.2	1.00	7.4	1.10
Gain of 5% to less than 10%	7.3	0.99	6.8	0.95	7.0	1.04
No change (between -5% and +5%)	ref.	ref.	ref.	ref.	ref.	ref.
Loss of 5% to less than 10%	8.8	1.19*	8.3	1.16	8.3	1.24
Loss of 10% to less than 20%	7.6	1.03	7.1	1.00	7.3	1.08
Loss of 20% to less than 30%	9.2	1.25*	9.0	1.26	8.5	1.26*
Loss of 30% or more	12.6	1.71*	12.2	1.70*	11.7	1.74*

* significantly different from the baseline probability at the 5% level
CA Census agglomeration
CMA Census metropolitan area
1. The model also includes the following variables (the reference category, used to calculate probabilities, is in parentheses): differences between regional and national unemployment rates at *t-2* and *t-3* (no difference), differences between regional and national hourly earnings at *t-2* and *t-3* (no difference), the income quintile at *t-2* (third quintile), the income quintile at *t-3* (third quintile), age (25 to 34 years), sex (male), province and distance from a large CMA (Ontario, less than 100 km), population of the CA or CMA (CMA with less than 500,000 people), family type (couple without children) and year (2008).
Sources: Statistics Canada, Longitudinal Administrative Databank, 1997 to 2008; Labour Force Survey, 1997 to 2008.

For all age groups, an increase in income of 30% or more is once again associated with a greater probability of migration, but to a lesser degree than for equivalent decreases in income.

Immigrants more sensitive to variations in regional economic conditions and to changes in income

So far, changes in regional economic conditions have been shown to have no significant effect on the probability of migration of the population of a region as a whole. However, these results are somewhat different for recent immigrants—those who have been living in the country 10 years or less.

Immigrants living in a region where the unemployment rate increases by one percentage point in relation to the national average between two years are 10% more likely to migrate than immigrants living in a region where the unemployment rate remains similar to the national average. Thus, a regional economic shock has a relatively small, but significant, impact on the probability that immigrants will leave their CA or CMA (Table 6). The results are similar for men and women.[10]

Like other Canadians, immigrants whose incomes drop significantly will migrate in larger numbers. Immigrants who experience a 30% or more decrease in income between two years were 71% more likely to leave their CA or CMA the following year than immigrants whose incomes remained stable. The impact of changes in income on migration probability is therefore relatively less important for immigrants than for Canadians in general, but, immigrants are more likely to react to changes in regional economic conditions.

It has been shown that immigrants are more mobile than other Canadians (Dion and Coulombe 2008). The findings in this section suggest that part of this greater mobility may be explained by greater sensitivity to changes in regional economic conditions.

Conclusion

The main objective of this study was to determine if there is a link between regional economic shocks and the migration of residents. The analysis primarily looked at census agglomerations (CA) and census metropolitan areas (CMA) with less than 500,000 residents.

This analysis began by showing that residents of CAs and CMAs with a population under 500,000 were much more likely to migrate than those in large metropolitan centres. In 2008, for example, the migration rate of people age 20 to 54 living in a CA of 10,000 to 19,999 was 7.9%, whereas it was only 2.3% for people of the same age living in a CMA of 500,000 or more.

When they leave, these individuals rarely move to a CA or CMA with a population similar to their CA or CMA of origin. Instead, they are the most likely to go to large metropolitan centres. However, after their migration, migrants from the smallest CMAs or CAs remain less likely than the population in general to live in a large CMA.

The analysis showed that residents of CAs or CMAs of under 500,000 were not generally influenced by regional economic shocks when their personal income was not affected. These economic shocks were measured by changes in regional unemployment rates and regional average hourly earnings in relation to the national average. This finding applies to both men and women as well as to both younger and older residents.

There is one notable exception. Unlike other Canadians, recent immigrants were somewhat more likely to move in the event of a regional economic shock. For example, an increase of one percentage point in the regional unemployment rate in relation to the national average between two years is associated with a 10% increase in the probability that immigrants will migrate, even when personal income does not change.

As for changes in personal income, they had a major impact on the migration of all groups. Individuals whose income drops by 30% or more between two years were, on average, 82% more likely to migrate than people whose income remained stable during those two years. For persons between the ages of 35 and 54, the effect is even greater.

The findings in this study have some application to public policy. First, they highlight the greater mobility of the populations of Canada's smallest cities. Unfortunately, our data do not allow us to say with certainty the degree to which these individuals left their regions for strictly economic reasons. However, results indicate that people react to changes in their personal economic situations. In other words, someone who experiences a drop in income will look to improve his or her circumstances and, often, will consider migration.

Appendix

CAs and CMAs by population-size category

CA with a population from 10,000 to 19,999

Amos (Que.)
Bay Roberts (N.L.)
Campbellton (N.B./Que.)
Camrose (Alb.)
Canmore (Alb.)
Cobourg (Ont.)
Cold Lake (Alb.)
Collingwood (Ont.)
Cowansville (Que.)
Dawson Creek (B.C.)
Dolbeau–Mistassini (Que.)
Elliot Lake (Ont.)
Estevan (Sask.)
Grand Falls–Windsor (N.L.)
Hawkesbury (Ont./Que.)
Ingersoll (Ont.)
Kenora (Ont.)
Kitimat (B.C.)
La Tuque (Que.)
Lachute (Que.)
Matane (Que.)
North Battleford (Sask.)
Okotoks (Alb.)
Petawawa (Ont.)
Port Hope (Ont.)
Powell River (B.C.)
Prince Rupert (B.C.)
Salmon Arm (B.C.)
Squamish (B.C.)
Summerside (P.E.I.)
Swift Current (Sask.)
Temiskaming Shores (Ont.)
Terrace (B.C.)
Thompson (Man.)
Tillsonburg (Ont.)
Wetaskiwin (Alb.)
Williams Lake (B.C.)
Yellowknife (N.W.T.)
Yorkton (Sask.)

CA with a population from 20,000 to 49,999

Alma (Que.)
Baie-Comeau (Que.)
Bathurst (N.B.)
Brandon (Man.)
Brockville (Ont.)
Brooks (Alb.)
Campbell River (B.C.)
Centre Wellington (Ont.)
Corner Brook (N.L.)
Courtenay (B.C.)
Cranbrook (B.C.)
Duncan (B.C.)
Edmundston (N.B.)
Fort St. John (B.C.)
Joliette (Que.)
Kentville (N.S.)
Leamington (Ont.)
Lloydminster (Alb./Sask.)
Midland (Ont.)
Miramichi (N.B.)
Moose Jaw (Sask.)
New Glasgow (N.S.)
Orillia (Ont.)
Owen Sound (Ont.)
Parksville (B.C.)
Pembroke (Ont.)
Penticton (B.C.)
Port Alberni (B.C.)
Portage la Prairie (Man.)
Prince Albert (Sask.)
Quesnel (B.C.)
Rimouski (Que.)
Rivière-du-Loup (Que.)
Rouyn-Noranda (Que.)
Saint-Georges (Que.)
Salaberry-de-Valleyfield (Que.)
Sept-Îles (Que.)
Sorel-Tracy (Que.)
Stratford (Ont.)
Thetford Mines (Que.)
Timmins (Ont.)
Truro (N.S.)
Val-d'Or (Que.)
Victoriaville (Que.)
Whitehorse (Y.T.)
Woodstock (Ont.)

CA with a population from 50,000 to 99,999

Belleville (Ont.)
Cape Breton (N.S.)
Charlottetown (P.E.I.)
Chatham–Kent (Ont.)
Chilliwack (B.C.)
Cornwall (Ont.)
Drummondville (Que.)
Fredericton (N.B.)
Granby (Que.)
Grande Prairie (Alb.)
Kamloops (B.C.)
Kawartha Lakes (Ont.)
Lethbridge (Alb.)
Medicine Hat (Alb.)
Nanaimo (B.C.)
Norfolk (Ont.)
North Bay (Ont.)
Prince George (B.C.)
Red Deer (Alb.)
Saint-Hyacinthe (Que.)
Saint-Jean-sur-Richelieu (Que.)
Sarnia (Ont.)
Sault Ste. Marie (Ont.)
Shawinigan (Que.)
Vernon (B.C.)
Wood Buffalo (Alb.)

CMA with a population from 100,000 to 499,999

Abbotsford (B.C.)
Barrie (Ont.)
Brantford (Ont.)
Greater Sudbury / Grand Sudbury (Ont.)
Guelph (Ont.)
Halifax (N.S.)
Kelowna (B.C.)
Kingston (Ont.)
Kitchener (Ont.)
London (Ont.)
Moncton (N.B.)
Oshawa (Ont.)
Peterborough (Ont.)
Regina (Sask.)
Saguenay (Que.)
Saint John (N.B.)
Saskatoon (Sask.)
Sherbrooke (Que.)
St. Catharines–Niagara (Ont.)
St. John's (N.L.)
Thunder Bay (Ont.)
Trois-Rivières (Que.)
Victoria (B.C.)
Windsor (Ont.)

CMA with a population of 500,000 or more

Calgary (Alb.)
Edmonton (Alb.)
Hamilton (Ont.)
Montréal (Que.)
Ottawa–Gatineau (Ont./Que.)
Québec (Que.)
Toronto (Ont.)
Vancouver (B.C.)
Winnipeg (Man.)

CA Census agglomeration
CMA Census metropolitan area

Conversely, when personal income does not change, people react very little to changes in regional economic conditions. Thus, the effects of regional economic shocks would be present, but direct and not indirect.

Immigrants present an interesting exception. Unlike other Canadians, they were more inclined to migrate as a result of changes in regional economic conditions, even if their income remained constant. Many Canadian communities have policies in place to attract and retain immigrants. The results of this study indicate that economic considerations play a role in an immigrant's decision on where to live.

Perspectives

Notes

1. One study showed that interprovincial migration resulted in a redistribution of human capital from the less wealthy and less urbanized provinces to the wealthier, more urbanized provinces (Coulombe 2006).

2. At the federal level, agencies have been created to promote regional economic development, particularly outside large metropolitan centres. These agencies include the Atlantic Canada Opportunities Agency, the Economic Development Agency of Canada for the Regions of Quebec, the Federal Economic Development Agency for Southern Ontario and Western Economic Diversification Canada. Issues related to regional economic development are equally important at the provincial level. See Joanis et al. (2004) for a discussion of regional development policies in Quebec.

3. In the United States, studies on the relationship between economic shocks and migration have looked mainly at the migration between states. For example, Cebula (2005) shows that the ability of a state to attract migrants was an increasing function of its income per person and its employment rate. In contrast, Anjomani (2002) finds no significant link between, on the one hand, growth in employment and a state's revenue and, on the other hand, its net migration rate.

4. According to two studies, the probability of migrating to another province is related to the provincial unemployment rate. The results of those studies show that an increase of one percentage point in a province's unemployment rate is associated with a 10% increase in the probability that residents of that province will migrate (Bernard et al. 2008 and Finnie 2004). According to another study, interprovincial migration depends more on long-term structural characteristics than on short-term local economic shocks (Coulombe 2006). Finally, another study showed that immigrants had reacted strongly to the increased demand for labour in Alberta during the five years following 2000 by becoming more inclined to move there (Ostrovsky et al. 2008).

5. Rural areas and towns with less than 10,000 residents are not included in this study. For an analysis of the migration profile of those regions, see Rothwell et al. (2002).

6. Nationally, this was a period of economic growth dominated by a generally downward trend in unemployment until the start of the economic slowdown in 2008. This period was characterized, however, by a sharp drop in manufacturing employment, which hit many communities with a high concentration of employment in that sector particularly hard (Langevin 2010).

7. The choice of the period covered by the analysis was established largely on the basis of the data limitations. The most recent year available in the Longitudinal Administrative Databank (LAD) at the time of this study was 2008. In addition, 1997 was the first year of data on wages available in the Labour Force Survey (LFS). Since lagged values *t-1*, *t-2* and *t-3* for average hourly wages were used, the first possible migration period is from 1999 to 2000.

8. The postal code is provided by the tax filer on his or her income tax return, generally before April 30 each year. However, the time can vary from one individual to another, adding a degree of imprecision to this study's measurement of migration.

9. The sample of CAs and CMAs of origin is limited to CAs and CMAs of 50,000 or more and less than 500,000. However, the sample of CAs and CMAs of destination includes all CAs and CMAs of 50,000 or more.

10. Regressions were also run by immigrants' level of education on arrival. Results are similar when samples of immigrants who arrived in Canada with or without a university degree are considered (data not shown). An interesting possibility for future analysis would be to examine the role of the characteristics of immigrants on arrival on the relationship between regional economic shocks and migration.

11. An increase in unemployment is normally triggered by a drop in the demand for labour, which in turn puts downward pressure on wages.

12. This is the distance, in kilometres, between the CA or CMA and the closest CMA of 500,000 or more. Google Map was used to estimate the distance. When there was more than one route to the closest large CMA, the

shortest route was selected. Distances are generally from downtown to downtown. In the case of the municipality of Wood Buffalo in Alberta, which covers a large territory, the community of Fort McMurray (the most populous) was used as the point of origin.

13. This variable of distance from large metropolitan centres may also be seen as a substitute for population density in a given radius around the region. Small and medium-sized centres often tend to develop close to large metropolitan centres so that, in general, the farther one is from such centres the less dense the population.

14. Taking the effect of unobserved variables into account by running random effects models (which look at omitted heterogeneity) was considered. However, such models are based on the assumption that unobserved variables are not correlated with variables already in the model, in which case the coefficients of interest may be biased. Since education and labour force status are normally strongly correlated with income, a key variable included in the model, this technique was not used for this analysis.

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